

the assignment process would add greater complexity to the process and a greater likelihood that the process will bog down. Indeed, the comparative criteria currently in use by the Commission appear to be irrelevant to the goal of enhancing the existing service with ATV, as opposed to creating a new broadcast service.

Although the Commission's traditional comparative criteria are irrelevant to enhancing existing services with ATV technology, some may urge their application in the ATV assignment process. Non-technical criteria might be argued to include some measure of the applicant's contribution to the diversity of programming available in a particular market. Some kind of structural principle could be urged for congested urban markets, such as first accommodating a specified number of network affiliates, public television stations and independents, with principles for ordering subsequent applicants. Similarly, the Commission might be urged to reward applicants for the size of their coverage areas or audience served; the length of time that either the channel or current licensee had been on the air; the current hours of operation; or the past program service record of the applicant, including airing of programs on issues of local public interest.

The Working Party is expressly postulating here that there will not be enough ATV supplemental spectrum to accommodate current television broadcast licensees and vacant non-commercial allotments and that, consistent with the

objective of facilitating transition to ATV operations expressed in the Commission's Tentative Decision and Further Notice of Inquiry, 3 F.C.C. Rcd. at 6525, each such licensee and vacant non-commercial reservation would be accommodated before the Commission would consider assigning ATV spectrum to newcomers. The Commission would find itself comparing "apples" and "oranges" if new entrants had to be compared to currently licensed television broadcasters. Of course, to the extent that ATV spectrum turns out not to be scarce once existing television broadcasters have been able to upgrade their operations, non-technical criteria might become relevant. Until that time, however, it seems advisable for the Commission to consider in its ATV assignment determinations only those factors that relate to the technical parameters of ATV operation and coverage.

Finally, the Commission could consider making the ATV assignment in the form of a construction permit, non-use of which within a stated period would result in its forfeiture. The likelihood of conflicts and challenges in a comparative process could be reduced by insisting on strict qualifications for applying for supplemental spectrum before the Commission would apply the comparative criteria. Such qualifications might include: (1) proof that the applicant is a holder in good standing of a license (or construction permit) for an existing NTSC station, in compliance with specified FCC regulations; and (2) proof of financial ability and a

statement of intent to undertake ATV upgrades within a stated period.

B. Lotteries.

Lotteries are now familiar tools for choosing among competing applicants. The Commission's Tentative Decision and Notice of Further Inquiry regarding ATV posited that lotteries could be used as part of a two-step process.^{14/} That is, the Commission would first optimize allotments on a national basis by associating supplemental allotments with particular channels in those cases where no other allotment would be suitable. Where particular supplementary allotments were suitable for more than one station, lotteries (or hearings or private agreements) might be employed to make the final selections. Presumably, if a system of ATV simulcasting were adopted (as opposed to a receiver-compatible ATV system based on augmentation of an NTSC channel, where the suitability of the specific augmentation channel to a particular NTSC is a relevant factor) it may be possible to employ lotteries to make all the ATV assignments in a market.

1. Advantages of Assigning Supplemental ATV Spectrum by Lottery.

A lottery system could result in faster implementation of broadcast ATV than comparative hearings or

^{14/} 3 F.C.C. Rcd. at 6538-39.

private agreements. In contrast, even an "expedited" or a "paper" hearing would prolong and complicate the process, especially because it would be difficult to achieve a consensus on the issues that would be germane in such a hearing. Sufficiently objective criteria -- such as the technical suitability of the supplementary spectrum and a station's financial ability to implement ATV broadcasting in a given time -- could be used to qualify applicants for the lottery in the first instance and thereby limit the number of applicants. If the channel were not used for ATV within the specified time period, presumably it would go back into the pool and be reassigned in a subsequent lottery. Again, it should be noted that criteria such as those relating to the speed with which a station is committed to implement ATV services are probably more appropriately applied to commercial stations than to noncommercial stations.

A lottery system would be less expensive for applicants. Thus, the resources that would otherwise go into a comparative hearing could be applied to ATV implementation. Even if comparative hearings could be streamlined so that participants were limited to current licensees, the cost of preparing testimony, motions, and findings would be substantial. Not only would the cost to the parties be substantial, but the benefits of the hearing process are questionable, as the distinctions upon which decisions are made are often trivial.

Lotteries are less expensive for the Commission to administer than comparative hearings. Conserving the Commission's resources is important, as is conserving the resources of the parties vying for selection, and the comparative hearing process is notoriously expensive in terms of its demands on the Commission's lawyers, administrative law judges, and support staff.

Because all applicants would be current licensees of the Commission, extensive prescreening of applicants would not be necessary; rather, prescreening need only entail examination of financial qualifications and possibly some assessment of intent to implement ATV in the near term. Because of the relative simplicity of such a prescreening procedure, the risk of choosing an unqualified applicant would be low, compared to such risk in situations where the applicants are new would-be licensees and speculative applications are common and hard to detect. It therefore follows that the risk is lower in the ATV context that a lottery winner would be vulnerable to a petition to deny and ultimate disqualification after selection, which would delay the implementation process.

A lottery system would allow supplemental allocations to be made all at one time in a market, so that a "head start" problem could be avoided. On the other hand, an assignment system incorporating comparative hearings or private negotiations of indeterminate length would result in a situation where some supplementary ATV assignments would be

ready to be made and implemented before others, so that the later entrants could be at unfair competitive disadvantage.

2. Disadvantages Of Assigning Supplemental ATV Spectrum By Lottery.

The encouragement of speculative applications is one of the main drawbacks of the lottery-based selection procedures that have been established in other services. Such speculative applications can clog the Commission's processes and delay the implementation of new services. However, as long as the pool of applicants for supplemental ATV spectrum were limited to existing licensees, there would not be the problem of dealing with the large numbers of speculative applications that occur, for example, in the low-power television service.

Because the supplementary spectrum subject to the lottery may not be fungible, the lottery might not result in an optimum matching of supplementary frequencies with existing stations. If a receiver-compatible ATV system that utilizes an augmentation channel is chosen, it is very possible that no two supplementary channels allotted to a market would be of equal technical suitability to a licensee. In such circumstances, a lottery might be an inefficient assignment method. This problem could be ameliorated through private agreements following the lottery, but it still might be less efficient than a procedure that took relative technical suitability into account in the first instance. In addition, the need to negotiate private agreements would reduce the principal

advantages of the lottery option -- namely, simplicity and quick implementation. Even if post-allotment private arrangements were allowed, there would still be the possibility of speculative applications by stations with no intention of implementing ATV, and it would be difficult to design a system that would prevent such speculation.

It is very possible that any assignment method chosen by the Commission will be contested, and litigation over lottery procedures might negate the advantage of quickness of implementation. A lottery method seems straightforward, and the Commission has used it in other contexts. However, it is unclear what, if any, new legislative authority would be needed to protect an ATV lottery procedure from legal challenge.

The present statutory authority for "mass media" lotteries (Section 309(i) of the Communications Act) was enacted not only to expedite implementation of new services, but also to reduce application backlogs and avoid multi-party comparative hearings.^{15/} These last two factors may not be as pertinent in the ATV context, where the only applicants would be existing licensees and technical constraints could further limit the number of eligible applicants. Further, Section 309(i) requires that the

^{15/} H.R. Rep. No. 765, 97th Cong., 2d Sess. 38 (1982).

Commission implement diversity and minority preferences in "mass media" lotteries; litigation over a decision to impose, or not to impose, these or other preferences could be expected.^{16/}

Finally, it should be pointed out that, while they are potentially less procedurally cumbersome than comparative hearings, lotteries afford less opportunity for consideration of nonobjective factors; thus, the issue of whether the greatest public benefit will result from the use of ATV technology by a group of stations selected at random could be controversial and ultimately contested.

C. Auctions.

A third method for assigning ATV spectrum is for the Commission to auction it. Congress has authorized the use of auctions to allocate other publicly owned resources, such as leases on tracts in the outer continental shelf for the exploration and extraction of oil and gas deposits, coal leases, Treasury bills, and leases of land containing geothermal steam.^{17/}

^{16/} Cf. Telecommunications Research & Action Center v. FCC, 836 F.2d 1349 (D.C. Cir. 1988)

^{17/} See Kwerel & Felker, Using Auctions to Select FCC Licensees, OPP Working Paper 16, Federal Communications Commission (May 1985).

1. Advantages of Assigning Supplemental ATV Spectrum By Auction.

Auctions induce the assignment of scarce resources to those who value them most. Markets generate and use large quantities of specialized information that is difficult and costly for government officials to obtain. As one kind of a market mechanism, an auction summarizes this vast quantity of information through prices, thereby providing an efficient means for initially placing scarce resources in the control of those who value them most.^{18/}

Compared to non-market alternatives, an auction can, under certain circumstances, accomplish this initial allocation of resources to their highest-valued use with relatively low transaction costs. If ATV frequencies could be sold, they should, in principle, gravitate to their highest-valued uses over time, regardless of the initial allocation process used; auctions, however, could speed that process by awarding the frequencies initially to those persons whose winning bids implicitly reflect the highest expectation of the value that can be derived from use of the frequencies.

Finally, auctions could capture for the United States Treasury any scarcity value of the ATV license at the time of initial assignment.

^{18/} See Hayek, The Use of Knowledge in Society, 35 Amer. Econ. Rev. 519 (1945); McAfee & McMillan, Auctions and Bidding, 25 J. Econ. Lit. 699 (1987).

2. Disadvantages of Assigning Supplemental ATV Spectrum By Auction.

Auction are criticized on the grounds that they assign scarce resources only to those persons having the greatest ability to pay -- that is, those possessing the greatest wealth or income. More precisely, auctions would assign spectrum to those with the greatest expectation of return from use of the spectrum and who have access to the necessary capital.^{19/}

Auctions also ignore non-pecuniary factors that might be valued by society, which the Commission's current assignment process is designed to foster. However, this argument against using auctions is weakened to the extent that one characterizes the initial assignment of ATV broadcast frequencies as being merely an upgrade of an existing service and thus not analogous to the addition of a new "voice" within a community.

Another disadvantage of auctions is that, because broadcasters would be made to pay for the ability to upgrade their service to the public, not all broadcasters necessarily

^{19/} Economists describe the demand for a good to be a function of three variables: the price of the good itself, the price of other goods, and the consumer's income (or wealth). See, e.g., G. Stigler, The Theory of Price 19-32 (4th ed. 1987). Although demand for ATV spectrum could be expected to increase as a bidder's income increased, the bidder's willingness to pay also would reflect its expectation as to how productively it could use the ATV spectrum.

would be willing to convert to ATV operation if there was some minimum bid required. This result might arise because the required hardware would itself be very expensive.^{20/} It also could occur because, while ATV may provide enhanced service to the public, it may not yield additional revenues for broadcasters. Thus, the scarcity value of the ATV license, over and above the regular license, may be \$0. This stifling of demand for development of ATV spectrum, if it occurred because broadcasters were not willing to pay to use the spectrum, clearly would frustrate rather than advance the Commission's stated goal of encouraging rapid transition to ATV on a broad scale.

The legal authority of the FCC to proceed with auctions is unclear. The Communications Act does not confer any explicit authority on the Commission to auction television broadcast spectrum. Indeed, it is generally assumed that the Commission has no authority to auction broadcast frequencies in the first instance. Even with regard to ATV spectrum to be auctioned to existing licensees, it is not clear that the Commission could infer that the Communications Act gives it

^{20/} Alternatively, if there were no minimum bid and the pool of applicants were limited to existing licensees in the community, it is possible that the market for ATV spectrum would clear at a price of \$0.

such authority implicitly.^{21/} If the FCC used a market mechanism to assign ATV licenses without explicit statutory authorization, it might be said that the Commission had unlawfully delegated to the marketplace the determination, pursuant to Section 309(a) of the Communications Act, that the grant of an application would serve the public interest, convenience, and necessity.

Even assuming it to be lawful, an auction of ATV frequencies would raise additional complexities for the Commission. Any use of auctions would require first defining the scope of the spectrum rights to be assigned, as well as the class of eligible bidders.^{22/} For example, using an auction to decide whether an ATV channel should be allotted to New York City (for say, its fifth channel) or to Hartford (for say, its first channel) might lead to results incompatible with Section 307(b) of the Communications Act if the bidders for the channels were advertiser-supported broadcasters. Depending on how the Commission weighted first ATV service in

^{21/} It might be argued that the assessment powers conferred on the Commission pursuant to the Independent Offices Appropriations action of 1952 could be construed to allow the Commission to charge licensees for the "the value of the service or thing to the recipient." 31 U.S.C. § 9701. However, this interpretation would seem to be superseded by subsequent, and more specific, congressional statements limiting the Commission's authority to use auctions.

^{22/} The potential Ashbacker issue raised here is being analyzed by the Working Party in a separate report.

a community, the public interest benefits to the citizens of Hartford from their first channel might exceed the public interest benefits to the (more numerous) citizens of New York City for their fifth channel, even though an advertiser-supported broadcaster might simply compare one-fifth of a five-broadcaster ATV market in New York City with all of a one-broadcaster ATV market in Hartford.^{23/}

Under any auction scenario for ATV supplemental spectrum, bidders in the first few auctions might not have a good idea of the environment in which they would be operating their ATV channel and thus might not be easily able to value that channel. For example, the prices bid in Hartford would depend on the prices bid in Boston and New York, and on the number of other ATV channels operating in Hartford.^{24/}

^{23/} One approach to auctioning of ATV channels would be to solicit bids from all eligible entities. The bid would state the location, the channel desired, and the amount of the offered price. The FCC would then run a computer algorithm to determine the group of bidders whose bids could be granted, consistent with the technical constraints, and which maximized revenue from the bids granted. This approach has the advantage that it would maximize government revenue. But, it has the disadvantage that it would run the risk of the market failure described above for Hartford and New York City. An alternative approach would be first to allot ATV channels to communities and then allow bidding for those channels. This approach has the advantage that it allows the Commission to determine the number of ATV channels in each community.

^{24/} This analysis ignores the fact that individual ATV channels in Hartford will vary greatly in value to a broadcaster depending upon the specific channel (for example, Channel 4 versus Channel 69) and the location of co-channel operations.

D. Private Agreement/Partial Assignment.

The Mass Media Bureau has described one additional assignment scenario by which the Commission would initially assign ATV capacity "to all licensees uniformly" and then permit stations "to acquire additional capacity needed from others." This scenario can be described as "private agreement/partial assignment." Each licensee would receive a partial assignment of the required amount of spectrum to provide ATV service and would then face the private decision of whether to acquire the remainder or transfer its own ATV spectrum to another licensee who placed a higher value on commencing ATV operation. The Commission, for example, would assign (by whatever means) to all existing television broadcast licensees an additional 4 MHz of spectrum for ATV and let them trade among themselves for the additional spectrum each would need to convert to ATV operation, if the broadcaster wanted to do so.^{25/}

The approach requires elucidation in several respects. First, it presupposes that the Commission has already resolved the relationship of the assignment process to the allotment process. A second and related complication is

^{25/} Alternatively, for example, the Commission could give some (but not all) existing television broadcasters the full 6 MHz of additional spectrum that each would need to convert to ATV operation and let these broadcasters trade full blocks of ATV supplemental spectrum.

that the ability to trade ATV assignments so as to increase the number of ATV broadcast stations in a given locale might depend on whether ATV spectrum allocated to one community (say, Hartford) may be privately transferred for use in a more populous neighboring community (say, New York City). In other words, would ATV spectrum be privately transferable from one community to another? This question raises the same issue identified earlier, in the discussion of auctions, with respect to Section 307(b). Thus, private agreement/partial assignment raises questions of allotment and assignment on both a local and national basis.

Third, depending on the requirements of the ATV system adopted by the Commission, there may be technical factors limiting the interchangeability of spectrum, regardless of whether the assignees of such spectrum would otherwise be willing to trade it among themselves.

1. Advantages Of Private Agreement/
Partial Assignment.

Possible advantages of the private agreement/partial assignment approach can be adduced. First, it is a market allocation of spectrum and thereby enhances economic efficiency, to the extent that a market allocation would do so. Second, it would impose lesser costs or competitive disadvantage on broadcasters than would the other principle market mechanism -- auctions.

2. Disadvantages Of Private Agreement/
Partial Assignment.

There are several possible disadvantage of private agreement/partial assignment. First, the Commission's legal authority to permit such assignments is ambiguous. The Commission has the responsibility to allocate spectrum among competing uses. Private agreement/partial assignment might be characterized as unlawfully delegating that assignment responsibility to private parties. The probable need for legislation is heightened by the fact that granting a licensee the authority to "sublet" ATV spectrum to another licensee might appear to be creating a property right in such spectrum.

Second, the transaction costs of subdividing, distributing, and reassembling spectrum blocks among "partial" ATV uses might be high. The extent of such cost, however, would depend on the manner in which the Commission resolves the overarching questions of allotment and assignment. Moreover, for a particular broadcaster to secure the requisite contiguous frequencies necessary to assemble a 6 MHz block of ATV spectrum, he might be forced to negotiate with a single "seller," an indeterminate bargaining posture prone to delay. The transaction costs of negotiating a transfer of the desired spectrum might escalate significantly under such conditions.

V. RECOMMENDATION.

As noted at the outset, the Working Party is unable at this time to make any recommendation as to the preferred means by which to assign ATV spectrum. As Part I of this report indicates, the selection of an assignment option cannot be made on an informed basis until numerous preliminary considerations are clarified. For example, the various proposed ATV systems differ significantly in the amount of spectrum they require; thus it is not yet clear how many potential ATV channels are available or how the available channels will rate in relative attractiveness. Therefore, while the Working Party has identified a number of relevant variables, it has no basis as yet for assigning weights to these variables so as to compare the different assignment options.

ATTACHMENT B

HIGH DEFINITION TELEVISION
TRANSITION SCENARIO FOR TV STATIONS
A CBS WORK-IN-PROGRESS

October 23, 1990

Preliminary Results

HIGH DEFINITION TELEVISION

TRANSITION SCENARIO FOR TV STATIONS

A CBS WORK-IN-PROGRESS

1. INTRODUCTION

High Definition Television is a major technical advance over the present NTSC broadcast system. Having twice the resolution, improved color rendition, a wide screen aspect ratio, and digital stereo sound, HDTV may prove to be the medium of choice for home by the turn of the century.

No regulatory or technical barriers hinder the introduction of wide-band high definition service to the home through the distribution media of home video, cable, or direct broadcast by satellite.

Terrestrial broadcasting, however, in attempting to compete with these new high quality services, faces a special challenge. High definition television intrinsically requires a greater transfer of information than can be obtained within the 6 MHz currently allowed for by NTSC television. The radio frequency spectrum is crowded, and the limited spectrum available precludes an unlimited allocation for the use of a new wide bandwidth terrestrial transmission system.

Past Chairman of the FCC, Dennis Patrick, formed an Advisory Committee in Advanced Television Service (ACATS) in 1987, with a mandate to study and test proposed systems for the terrestrial broadcast of Advanced

Television, and to make recommendations for the selection of a standard.

Under the chairmanship of Richard Wiley, a past Chairman of the FCC, ACATS has made much progress in the last three years. In 1988 the FCC tentatively decided that HDTV service should be integrated with and be compatible with the existing NTSC service and its tradition of localism and diversity. Further, the FCC found that HDTV service should not impair or restrict current NTSC broadcast service.

In 1989, Alfred Sikes became Chairman of the FCC, and under his leadership, the FCC announced that a terrestrial transmission standard would be chosen by the middle of 1993.

Secondly, Chairman Sikes determined that priority should be given to the selection of a simulcast system in which TV stations would broadcast both a NTSC and a HDTV signal.

Further, Chairman Sikes has emphasized that the public interest is best served by the adoption of a technically excellent standard.

The ACATS work continues, with three subcommittees, 13 working parties and numerous Specialist Groups, together involving some 450 experts in many fields. Three interim reports have been presented to the FCC.

In 1988, CBS defined requirements of a HDTV terrestrial broadcast system:

- (i) Existing NTSC service should continue unimpaired during the transition period.
- (ii) The broadcast system should be competitive in quality with that provided by other non broadcast distribution media.
- (iii) The system should provide technical headroom for future improvements in order to retain competitive parity.
- (iv) The propagation system should be spectrum efficient.
- (v) The transmission system format should be capable of interfacing with other distribution media.

In addition to detailed spectrum studies and the test and evaluation of proposed systems, ACATS is developing assessments of the cost of converting local TV stations for HDTV terrestrial broadcast. This work is being performed by the System Subcommittee's Working Party 3.

CBS is contributing to this effort with an ongoing study of the costs of implementing HD terrestrial broadcast service, and this interim report details the results to date.

While recognizing that ATV service using improved and extended definition TV technology may prove attractive from the broadcasters' point of view, this study is concerned only with full HDTV service. This is in accord with present FCC policy, which is to first assess a high definition --and not an extended definition, or EDTV--transmission standard.

Following Chairman Sike's policy directive, this report considers only HDTV simulcast systems. A simulcast system is one in which the existing NTSC broadcast channel remains unimpaired (an FCC requirement), and a second 6 MHz channel is allocated for the transmission of HDTV programs. Thus, a television station may transmit a program in HDTV and NTSC simultaneously.

The simulcast approach will permit system designers the opportunity to seek the best possible system for terrestrial broadcast, and will allow stations to start HD service only when it is economically advantageous for them to do so.

This report thus represents a work-in-progress, and invites a dialogue on the complex issues confronting the industry on the timing, phasing, and the cost of the transition to HD.

The CBS study is continuing, and is supported by important contributions from CBS affiliate stations, who are providing data on their past, current, and projected capital investments, and on the feasibility of adding a HD transmitting antenna to their towers.

2. PREMISES AND ASSUMPTIONS

A number of important working premises and financial assumptions have been made in developing transition scenarios. These are outlined in Figure 1, listed below, and discussed in more detail later.

- (i) Stations in the larger markets will be the first to make the transition to HD, not unlike the introduction of color television.
- (ii) The transition will be conducted in phases, with each phase adding to the HD service provided by a station. Stations in larger markets will complete the transition in a shorter time than smaller market stations who may thus spread the capital investment program over a longer period. This again is similar to the introduction of color.
- (iii) The labor cost of transition is 20% of the investment in capital equipment.
- (iv) The transmission system selected will be all-digital and thus will require a much lower Effective Radiated Power (ERP) than current NTSC systems to reach the same audience. With a resulting, relatively small, HD transmitting antenna, the existing tower can be used.
- (v) The initial prices for equipment are based on developmental and prototype units. For the period considered, with each doubling of the number of units manufactured, the cost will fall by 10% of the initial cost.

SIMULCAST HDTV TRANSITION SCENARIO ASSUMPTIONS

- **LARGER MARKET STATIONS WILL CONVERT FIRST**
- **TRANSITION IN PHASES, SPREAD OVER 5-9 YEARS**
- **LABOR TO INSTALL THE CAPITAL EQUIPMENT:
20% OF CAPITAL EQUIPMENT COST**
- **TRANSMISSION FORMAT WILL HAVE LOWER ERP
THAN NTSC - SMALLER ANTENNA PERMITS
INSTALLATION ON PRESENT TOWER**
- **EACH DOUBLING OF HD EQUIPMENT MANUFACTURED
WILL LEAD TO 10% REDUCTION IN INITIAL COST**
- **EXISTING AUDIO EQUIPMENT WILL BE REUSED, NOT
REPLACED**



- (vi) Existing plant, studio, and control room audio equipment will be reused, not replaced. It is further assumed that a station has previously converted to stereo.

3. PHASED IMPLEMENTATION

The introduction of a HDTV transmission service at a TV station will be a gradual process and will be implemented in phases. Each phase provides an incremental capability, and builds upon the preceding phases.

(Figure 2) The number of phases, and the nature of the capability added in each phase, may vary from market-to-market or from station-to-station.

Here is one, six-phase scenario:

Phase A: Network Pass-through

This is the minimum conversion necessary to deliver network supplied HDTV programming to a market. An additional transmitter and antenna will need to be purchased and installed, together with an additional studio-transmitter link, using microwave or fiber optics. Additional satellite earth station equipment for the reception of network programs, and some distribution, test, and monitoring equipment will be required. The only local origination is the insertion of station identification announcements.

Phase B: Local Commercials

In phase B, additional equipment will be added by the station to allow for local commercial inserts within the network programs.